International Union of Pure and Applied Chemistry

Compendium of
Chemical Terminology
IUPAC RECOMMENDATIONS

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SECOND EDITION

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conversion, internal
See *internal conversion*.
O.B. 101

conversion spectrum
A plot of a quantity related to the absorption (absor-
bance, cross section, etc.) multiplied by the quantum
yield for the considered process against a suitable
measure of photon energy, such as frequency, ν,
wavenumber, σ, or wavelength, λ, e.g. the conversion
cross section, $\sigma\varphi$, has the SI unit m^2.
See also *action spectrum, efficiency spectrum,
spectral effectiveness*.
1996, *68*, 2234

converter, wavelength
See *wavelength converter*.
1995, *67*, 1758

co-oligomer
An *oligomer* derived from more than one species of
monomer.
1996, *68*, 2300

co-oligomerization
Oligomerization in which a *co-oligomer* is formed.
1996, *68*, 2306

cooling, radioactive
See *radioactive cooling*.
1982, *54*, 1538

cooperative transition
A transition that involves a simultaneous, collective
displacement or change of state of the atoms and/or
electrons in the entire system.
Examples:
An *order-disorder transition* of atoms or electrons, as
in an alloy, a ferromagnet or superconductor; a *Jahn–
Teller* or *ferroic transition*; a *martensitic transition*.
1994, *66*, 580

cooperativity
Interaction between the *substrate* binding sites of an
allosteric enzyme. Binding of a substrate molecule to
one binding site changes the affinity of the binding
sites on the other subunits (cf. *allosteric enzymes*) to
the substrate by induction of a conformation change
at the other binding sites. Cooperative enzymes typi-
cally display a sigmoid (S-shaped) plot of the reaction
rate against substrate concentration.
1992, *64*, 151

coordinate covalence
See *coordination*.
1994, *66*, 1100

coordinate covalence (coordinate link)
See *coordination*.
1994, *66*, 1100

coordinate link
See *coordination*.
1994, *66*, 1100

coordination
The formation of a covalent *bond*, the two shared
electrons of which have come from only one of the
two parts of the *molecular entity* linked by it, as in

the reaction of a Lewis acid and a Lewis base to form
a Lewis adduct; alternatively, the bonding formed in
this way. In the former sense, it is the reverse of
unimolecular heterolysis. 'Coordinate covalence' and
'coordinate link' are synonymous (obsolescent)
terms. The synonym 'dative bond' is obsolete.
(The origin of the bonding electrons has by itself no
bearing on the character of the bond formed. Thus,
the formation of methyl chloride from a methyl cation
and a chloride ion involves coordination; the resultant
bond obviously differs in no way from the C–Cl bond
in methyl chloride formed by any other path, e.g. by
colligation of a methyl radical and a chlorine atom.)
The term is also used to describe the number of li-
gands around a central atom without necessarily im-
plying two-electron bonds.
See also *dipolar bond, π-adduct*.
1994, *66*, 1100

coordination entity
An assembly consisting of a central atom (usually
metallic) to which is attached a surrounding array of
other groups of atoms (ligands).
R.B. 145

coordination number
1. The coordination number of a specified atom in a
chemical species is the number of other atoms directly
linked to that specified atom. For example, the coor-
dination number of carbon in methane is four, and it
is five in protonated methane, CH_5^+. (The term is
used in a different sense in the crystallographic de-
scription of ionic crystals.)
1994, *66*, 1100
2. In an inorganic coordination entity, the number of
sigma bonds between ligands and the central atom.
Pi-bonds are not considered in determining the coor-
dination number.
R.B. 146

coordination polyhedron (polygon)
In a coordination entity, the solid figure defined by
the positions of the ligand atoms directly attached to
the central atom.
R.B. 146

coordinatively saturated complex
A transition metal complex that has formally 18 outer
shell electrons at the central metal atom.
1994, *66*, 1100

coordinatively unsaturated complex
A transition metal complex that possesses fewer li-
gands than exist in the coordinatively saturated com-
plex. These complexes usually have fewer than 18
outer shell electrons at the central metal atom.
1994, *66*, 1100

copolymer
A *polymer* derived from more than one species of
monomer.
Note:
Copolymers that are obtained by *copolymerization* of
two monomer species are sometimes termed bipo-

counter-ions
1. (in an ion exchanger): the mobile exchangeable ions.
1993, *65*, 854
2. (in colloid chemistry): ions of low relative molecular mass, with a charge opposite to that of the colloidal ion.
1972, *31*, 607

counter, radiation
See *radiation counter.*
1982, *54*, 1538

counter tube
Radiation detector consisting of a gas-filled tube or valve whose gas amplification is much greater than one, and in which the individual ionizing events give rise to discrete electrical pulses. Often an expression is added indicating the geometry (e.g. end window), composition of the gas (e.g. helium) or the physical process for its operation (e.g. proton recoil, fission).
1982, *54*, 1538

counter tube, Geiger–Muller
See *Geiger–Muller counter tube.*
1982, *54*, 1538

counter tube, proportional
See *proportional counter tube.*
1982, *54*, 1538

counting, absolute
See *absolute counting*
1994, *66*, 2517

counting efficiency
The ratio between the number of particles or photons counted with a *radiation counter* and the number of particles or photons of the same type and *energy* emitted by the radiation *source.*
1994, *66*, 2517

counting loss
A reduction of the *counting rate* resulting from phenomena such as the resolving time or the *dead time.*
1994, *66*, 2517; O.B. 217

counting rate
The number of *counts* occurring in unit time.
1994, *66*, 2517

coupled (indicator) reaction (in analysis)
A reaction which follows the (slower) reaction of kinetic interest, so as to provide means of monitoring the formation of a reaction product. This reaction is sometimes referred to as the *indicator reaction.*
1993, *65*, 2294

coupled simultaneous techniques (in analysis)
The application of two or more techniques to the same sample when the two instruments involved are connected through an interface, e.g. simultaneous thermal analysis and mass spectrometry.
O.B. 39

coupling
See *chemical induction.*
1996, *68*, 162

coupling constant (spin-spin), *J*
A quantitative measure for nuclear spin-spin, nuclear-electron (hyperfine coupling) and electron-electron (fine coupling in EPR) coupling in magnetic resonance spectroscopy. The 'indirect' or scalar NMR coupling constants are in a first approximation independent of the external magnetic field and are expressed in Hz.
1994, *66*, 1101

covalent bond
A region of relatively high electron density between nuclei which arises at least partly from sharing of electrons and gives rise to an attractive force and characteristic internuclear distance.
See also *agostic, coordination, hydrogen bond, multi-centre bond.*
1994, *66*, 1101

covalent network
See *network.*
1996, *68*, 2298

Cox–Yates equation
A modification of the *Bunnett–Olsen equation* of the form:

$$\lg ([SH^+]/[S]) - \lg [H^+] = m^*X + pK_{SH^+}$$

where X is the activity function $\lg (\gamma_S\gamma_{H^+}/\gamma_{SH^+})$ for an arbitrary reference base. The function X is called the excess acidity because it gives a measure of the difference between the acidity of a solution and that of an ideal solution of the same concentration. In practice $X = -(H_0 + \lg [H^+])$ and $m^* = 1 - \Phi$.
See also *Bunnett–Olsen equation.*
1994, *66*, 1101

cracking
The thermal or catalytic decomposition of a compound such as a hydrocarbon into chemical species of smaller molecular weight.
1990, *62*, 2183

cream
A highly concentrated *emulsion* formed by *creaming* of a dilute emulsion.
1972, *31*, 611

creaming
The macroscopic separation of a dilute *emulsion* into a highly concentrated emulsion, in which interglobular contact is important, and a continuous phase under the action of gravity or a centrifugal field. This separation usually occurs upward, but the term may still be applied if the relative densities of the dispersed and continuous phases are such that the concentrated emulsion settles downward.
1972, *31*, 611

cream volume
The volume of *cream* formed in an *emulsion.*
1972, *31*, 616

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